THE EFFECTS OF IMAGE VALENCE ON AUDIENCE VISUAL ATTENTION AND PERCEPTION TOWARD PUBLIC SERVICE ANNOUNCEMENTS: THE MODERATING ROLE OF ISSUE INVOLVEMENT

By

MADOLYNNE OAKS

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Oklahoma State University

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Thesis Approved:

Dr. Mikyeung Bae

Thesis Adviser

Dr. Jami Fullerton

Dr. Stan Ketterer

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Abstract: The present study is designed to understand the circumstances under which a public service announcement would be most effective for high or low involved viewers. The research goal is to be able to examine which type of image (positive or negative) regarding global warming public service announcements (PSAs) captures and maintains audience attention. Information found in this study explored the aspects of visual attention, issue involvement, message credibility and overall attitude toward a message. The results found that message credibility had a positive effect on overall attitude toward the message. This study's findings can also add to the Dual-Process Models by providing unique insights for the Elaboration Likelihood Model and Heuristic-Systematic Model research. Moreover, the research collected in this study contribute to established literature while also questioning novel aspects of visual attention in relation to message credibility and attitude that have yet to be answered.

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CHAPTER 1

INTRODUCTION

Advertisements are used to educate or persuade audiences on differing issues of social significance. Certainly, public service announcements (PSAs) can be viewed as a form of similar communication, due to the idea that they wish to inform society about important information to educate society about an issue or persuade viewers to change behavior. PSAs, like advertisements, are geared toward catching audience attention and influencing them one way or another. ‘‘Public service announcements (PSAs) are designed to inform or induce certain behaviors in specific audiences, generally for noncommercial profit using mass media-approaches’’ (Bator & Cialdini, 2000, p. 527).

Given the prevalence and social significance of PSAs, the number of academic inquiries addressing the effects of these social messages has increased (Adnsager, Austin, & Pinkleton, 2001; Fishbein, Hall-Jamieson, Zimmer, Von Haeften, & Nabi, 2002; Godbold & Pfau, 2000; Meyer, Roberto, & Atkin, 2003; Paek, Hove, Kim, & Jeong, 2011). The existing research on PSAs has mainly focused on the effectiveness of different message appeals (Paek et al., 2011). Many PSA campaigns discuss health-related subjects such as AIDS, anti-drug, anti-tobacco or childhood obesity while others attempt to raise awareness about issues such as domestic violence, preventing wildfires, suicide prevention or texting and driving. Although the research literature on global warming communication campaigns is relatively new and not yet well developed,

other fields including commercial marketing, social marketing, public health and political science offer considerable research on the attributes of effective public engagement campaigns (Maibach, Leiserowitz, Roser-Renouf, & Mertz, 2011).

The uncomfortable interactions when individuals attempt to discuss climate change is an interesting interaction in American society. There seems to be a fear of starting a political debate or offending others who may feel differently about the issue, forcing people to push the subject aside altogether. However, there seems to be an American axiom where it is societally expected to be conscious of the problem, but not too outspoken. According to the United States Environmental Protection Agency (2017), global carbon emissions from fossil fuels have significantly increased since 1900. Since 1970, CO_2 emissions have increased by about 90 percent with emissions from fossil fuel combustion and industrial processes contributing about 78 percent of the total greenhouse gas emissions (EPA.gov, 2017). Even though the issue is more serious than ever, so far, no research has been conducted to study how the public interprets global warming PSAs in relation to visual attention.

Visual attention is an important concept to understand when mapping the cognitive mind frame of consumers. Gaining insights into viewers' visual attention is crucial to acquire information regarding what influences consumers' decision-making (Pieters & Warlop, 1999). Studying visual attention can provide valuable insight into consumer cognitive responsiveness. Where people look when observing advertisements has been a consistent area of interest in marketing, communication and advertising. According to Pieters and Wedel (2004) "in comparison to reading, scene perception, and visual search, there has been considerably less research on eye movements when looking at ads than there has been on these other topics (p. 31)." Capturing audience attention is important because advertisements that capture audience attention attract consumers so they select the advertisement from its environment. This results in

an increase in consumers' attention to the advertisement and its elements when compared to other advertisements (Pieters & Wedel, 2004). This idea is consistent with PSA research.

Eye-tracking devices offer an inexpensive and innovative means to accurately capture a reflection of the process of consumer information acquisition and decision-making (Behe, Bae, Huddleston, & Sage, 2015). Behe et al. (2015) stated "data acquired from an eye-tracking device provides a physical link between consumer characteristics (involvement) and attention (p. 11)." If researchers can find connections between eye movements and consumer behavior, there will be a better understanding of the psychological processes behind visual marketing for the future. Eye-tracking studies provide direct measures of eye movements in a realistic stimulus-based setting and do not force verbalizing memory-based consideration (Chandon, Hutchinson, Bradlow, & Young, 2008). It has been proposed that eye movements may be a better indication of underlying search for information in the buying process compared to self-reports because it is task-specific and difficult to consciously control (Behe et al., 2015).

This study explores two factors that might affect the attitude toward a PSA: type of image (positive or negative) and issue involvement. In addition, the current study experimentally examined the mediating role of message credibility in an attempt to explain whether credibility can create a foundation for understanding the overall attitude.

Because PSAs normally involve a public issue, evaluating issue involvement would allow a better understanding of viewers' reactions to the information. It is understood that every issue will have differing involvement levels, which in this study, can potentially change cognitive responses. Using the Dual Process Model, this study will contemplate how the level of involvement with global warming will affect visual attention.

Whether discussing it personally, politically or professionally, global warming, or climate change, has become one of the most controversial phenomena in America. Audience

segmentation research has noted that public opinion ranges from those who accept the scientific consensus and support urgent change to those who reject the scientific consensus view and the need for change— with the majority of the public holding an "intermediate" opinion in-between full acceptance and complete denial of the problem (Maibach et al., 2011).

The purpose of this study is to examine the relationship between visual attention devoted to a PSA relating to a current social and scientific issue. The study analyzes the influence of consumers' level of involvement with a product on the aforementioned relationship. The main goal of this study is to question what aspects of an image capture and entices audience attention to contribute to an area of research that has yet to be analyzed and add strong evidence to existing eye-tracking research. Moreover, this study will contribute to an advanced persuasion theory about issue involvement by collecting more data about how credibility affects attitudes toward a message. The following sections assesses previous academic findings in the literature review to connect variables to previous studies. Next, the method chapter explains all steps of the study. Then, the findings are reported in the results section. Lastly, the discussion of the implications of the findings, limitations of the study and potential for future research will be examined.

CHAPTER 2

LITERATURE REVIEW AND HYPOTHESES

Overview

The purpose of this chapter is to provide a conceptual literature background of variables to help understand what has been previously established or studied in academia in regards to the topics of this study. The chapter covers image valence, the history of visual attention research, the moderating role of issue involvement using the Elaboration Likelihood Model (ELM), the conceptualization of message credibility in relation to the Heuristic-Systematic Model and finally, attitude toward a message.

Public Service Announcement Message Appeal

Public service announcements (PSAs) are an important component of most communication campaigns (O'Keefe & Reid, 1990). While PSA research deems plentiful, most of the research is focused on which types of appeals to use in the sense of whether to use fear or non-fear appeals or if utilizing a spokesperson, peer or expert would increase the likelihood of persuadability (Paek, Hove, Ju Jeong, & Kim, 2011; Perse, Nathanson, & McLeod 1996). This study is not particularly studying differing emotional appeals but rather image valence as the message appeals. Noting the emotional response to any PSA is necessary.

While a high amount of PSA academic research focuses on health-related campaigns (such as AIDS, anti-marijuana, teens and alcohol addiction, etc.), the notion that message appeal could affect the likability of the PSA is applicable. According to Weber, Westcott-Baker and Anderson (2013), "a trend toward using theory in message design of PSAs is emerging (p. 302)."

Dillard and Peck (2000), examined the role of emotion in persuasion by having participants view eight PSAs and report their cognitive, emotional and attitudinal responses to each. The study found that emotions do exert an apparent influence on evaluations of the PSA. However, it mainly focused on whether emotions had a powerful impact on effectiveness using eight different types of unrelated PSAs. While it added to the idea of using fear or non-fear message appeals, this study lacked the connection to visual attention in relation to attitude toward the message.

Visual Attention

Most visual attention research has been conducted to test how the human eye processes different aspects of visual scenes, such as text versus pictoral. It is generally agreed that, under normal circumstances, human eye movements are linked to visual attention (Liu & Heynderickx, 2011). Since the pioneering work of Buswell (1935) and Yarbus (1967), it has been widely recognized that viewers' eyes are drawn to important aspects of the visual scene and their goals in looking at the scene very much influence their eye movements (Rayner & Castelhano, 2008). Time to first fixation is used in this study to measure how long it takes an individual to look at the stimuli. In general, eye fixation location reflects attention and eye fixation duration reflects processing difficulty and amount of attention (the more time the information is fixated, the more it might be processed) (Tsai, Hou, Lai, Lui, & Yang, 2011). Total fixation duration is used in this study to measure how long an individual looks at the stimuli.

The main purpose of an image in advertising is to attract the attention of the viewers to feel compelled to pay attention. How visual elements affect messages in advertising has been a popular subject of study for decades. Visual elements are integral parts of most ads and it is estimated that 75 percent of the information individuals take in is through visual observation (Cobb-Walgren & Mohr, 1998).

Image Valence

Valence refers to the direction of behavioral activation associated with emotion, either toward (appetitive motivation, pleasant emotion) or away from (aversive motivation, unpleasant emotion) when regarding a visual stimulus (Ander, Lotze, Erb, Wolfgang, & Birbaumer, 2005; Lane, Chua, & Dolan, 1999). Image valence was an important variable to consider in this study to see if the difference in visual stimuli would change results of eye fixations and whether visual attention can be a determinant of overall attitude toward a message.

A single dominant visual image related to a cause might be sufficient to produce significant positive affective response (Small & Verrochi, 2009). However, consumers often lack the motivation to process ads (Bae, 2016). Consequently, marketers have focused on understanding how differing visuals influence the ultimate success of their campaigns (Clow, James, Kranenburg, & Berry, 2008). Beyond attracting viewers' attention, the image(s) in an ad is typically meant to give rise to some emotional disposition toward the product, social cause, or whatever else the ad is about (Messaris, 1997).

Images in advertising is a popular topic of interest to scholars. Eye-tracking software testing image valence has investigated the relationship between image valence and drivers' perception of hazard perception and situational awareness (Jones, Chapman, & Bailey, 2014). There have also been valence studies associated with charitable donations (Bae, 2016; Chang & Lee, 2009). Bae (2016), in a similar model, however, used eye movement research to analyze the

differences between three advertising conditions but did not change the image. Instead, Bae (2016), changed the content of the advertising to study cause-related marketing by displaying three types of advertisements: informational, emotional or combined.

By examining image valence (presenting pictorial information either positively or negatively in an advertisement) in connection with visual attention, this study helps clarify if a difference in image affects cognitive responses through eye movements (Chang & Lee, 2009). Consumer research studies have found negative information to be more attention-grabbing and persuasive than positive information when processing information (Banks et al., 1995; Homer & Yoon, 1992). Banks et al. (1995) studied the effects of message framing on mammography utilization. The study questioned if framing a persuasive message in either "gains" (emphasizing benefits of mammograms) or "losses" (risks if participants do not choose to mammograms) would affect the power of the message. Even though the study pertained to a health issue, the concept of differing visuals was consistent with this study. According to Banks et al. (1995), loss-framed messages (for this study, the negative image) would be more attention-grabbing due to the emphasis of the risks of not engaging with the issue rather than gain-framed (positive) messages. Thus, the following research question (RQ1) is examined and hypothesis (H1) was predicted:

RQ1: Will image valence affect where viewers look first?
H1: A negative image will have a shorter time to first fixation.

Chang and Lee (2009) did not use eye-tracking in their study but instead used a survey to ask participants to evaluate a poster regarding child hunger to analyze if image valence affected an individual's likelihood to make a personal donation. Chang and Lee (2009) hypothesized image valence and message framing were affective in charitable appeals. They found the negative image seemed to boost the persuasion power of a negative message in the experiment, which is consistent with previous findings that negative images increase persuasive appeals in promoting charitable appeals (Chang & Lee, 2009). Chang and Lee (2009), proposed a "negatively framed message, especially with a matched image attached, could illustrate miserable outcomes when

help is not given so the audience may feel sympathy and a responsibility to help" (p. 2928). It is clear that the important aspects of a scene are typically fixated and therefore, generally looked at longer than less important parts of a scene. Fixations may vary on types of information, such as text or graphics, or types of specific tasks, such as reading or solving a problem. Therefore, this study posits a negative PSA in this study may be more likely to sustain audience attention due to individuals being more meticulous thus spending more time observing the negative image. This leads to the next research question (RQ2) and hypothesis (H2):

RQ2: Will image valence affect how long viewers look at an image?
H2: The negative image will keep audience attention longer than the positive image.

Dual Process Model

Two important persuasive theories make up the dual process model. The Heuristic-Systematic Model (HSM) (Chaiken, 1980, 1987), together with the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1981, 1986), recognize a host of variables conceptually independent from message quality that influence people. According to both HSM and ELM, these variables can trigger different information processing. Although people can carefully attend to and elaborate on the content of a persuasive message, they can also process the message superficially, attending only to cues peripheral to its content such as the length of the message and the source of the message (Todorov & Chaiken, 2002). As discussed later in the paper, ELM can be connected to issue involvement while HSM

can be associated with visual attention and message credibility.

Elaboration Likelihood Model

Developed in 1981 at the University of Missouri-Columbia by psychologists Richard E. Petty and John T. Cacioppo, The ELM essentially uses motivational and cognitive factors to

explain attitude change (Petty & Cacioppo, 1981, 1986). The ELM has been connected to various studies in an attempt to understand the role of cognitive processing routes (how humans psychologically process persuasive information). This study assumes the importance consumers place on products (level of involvement) should influence the way they visually collect and process information. The ELM provides a theoretical foundation for information processing and will help explain visual attention in connection to level of involvement (Behe et al., 2015).

According to ELM, attitude change occurs through one of two different routes: the central route or the peripheral route (Petty, Cacioppo, & Schumann, 1983). Accordingly, the more cognitive involvement in the processing of the message, the more likely higher elaboration is to happen. The lesser cognitive effort, the higher the chances for peripheral processing. To use the central route, the person must have either the ability to understand the message, the motivation to read or view the message, or the opportunity to read or view the message. If the person uses the central route to form an attitude, he or she will purposefully evaluate, or process, the message based on the quality of the arguments that are presented. During the evaluation of the arguments, the person will generate thoughts about the message.

If a person does not have the ability or motivation to process the message or has not been exposed to it, the peripheral route will be used. Furthermore, the peripheral route to persuasion happens when the attitude change is determined by using persuasive cues rather than analytical findings (Stiff & Mongeau, 2016). Attitude changes that occur through the peripheral route do not occur because the person has diligently considered the pros and cons of the issue; they occur because the person associates the attitude issue or object with positive or negative cues or makes a simple inference about the merits of the advocated position based on various simple cues in the persuasion context (Petty & Cacioppo, 1984).

Issue Involvement

One important factor in the ELM that influences motivation to engage in message-relevant thinking is issue involvement, or personal relevance of the issue (Bright & Manfredo, 1997). Issue involvement is important to study, because individuals who are more involved with a cause should be more compelled to like and participate in campaigns relative to those who are less involved (Grau & Folse, 2007). In this study, the definition of involvement used for the purpose of scale development was a person's relevance of the object based on inherent needs, values and interests (Zaichkowsky, 1985). Personal relevance is defined as the level of perceived personal importance and /or interest evoked by a stimulus with a situation (Antil, 1984). Consistent with such conceptualizations, cause involvement can be measured as the degree to which consumers find the cause to be personally relevant to them (Grau & Folse, 2007).

Petty and Cacioppo (1979, 1981) first demonstrated that issue involvement is a major influencer on the cognitive strategy used to process persuasive communication. Additionally, issue involvement interacts with characteristics of the message (June & Maibach, 1990). Issue involvement, or relevance, is known to be a moderator of the visual cognitive process (Darley & Lim, 1991; Greenwald & Leavitt, 1984). Shimp, 1986, discussed how "the amount of arousal or interest (involvement) determines the degree of attention devoted to an advertisement (p. 10)." High personal relevance enhances the relationship between attitude toward the ad and intentions as well as between attitude toward the issue and intentions (Darley & Lim, 1991).

Therefore, the ELM framework may help explain how information is processed by consumers with high or low involvement when viewing a PSA. According to the ELM, highly involved individuals may engage in more complex processing of messages that provide information relative to individuals that are less involved (Petty et al., 1983). The ELM suggests level of involvement influences the amount of mental and physical effort the consumer invests in the buying process (Petty and Cacioppo, 1981, 1983). According to Behe et al. (2015),

ELM indicates individuals with high product involvement process information through a central route in which they carefully examine information they believe is fundamental to a meaningful and logical evaluation. Behe et al. (2015) conducted an eye-tracking study that offered insight into processing and information acquisition strategies in that consumers' level of involvement with the product determines their attention and information seeking strategies and patterns. Their study strengthened the role of consumer involvement to decision-making as proposed by the ELM in that for highly involved consumers, all display elements appear to be processed as central cues because they exhibited a higher level of visual attention in both price and product than those who were less involved (Behe et al., 2015).

Thus, the following hypotheses (H3) are proposed:

H3: Issue involvement will moderate the relationship between image valence and visual attention.

H3a: Individuals with a higher level of involvement will have a shorter TFF regardless of the condition type; whereas participants with a lower level of involvement will have a shorter TFF with the negative condition.

H3b: Individuals with a higher level of involvement will have a longer TFD regardless of image type; however, those with a lower level of involvement will have a longer TFD with the negative condition.

Message Credibility

Within the field of communication, few concepts have received more scholarly attention than the issue of credibility (Metzger, Flanagin, Eyal, Lemus & McCann, 2016). Credibility has been revealed to be one of the most important factors determining the effects of a persuasive message (Petty & Cacioppo, 1981). MacKenzie and Lutz, 1989, define credibility as "the extent to which the consumer perceives claims made about the brand in the ad to be truthful and believable (p. 51)." Numerous studies have shown if a company envokes more favorable public

perceptions, positive attitudes toward the ad will be increased (Goldsmith, Lafferty, & Newell, 2000a, 2000b).

Heuristic-Systematic Model

Within any given judgmental context, the heuristic-systematic presents two basic modes by which perceivers may determine their attitudes (Chen & Chaiken, 1999). The Heuristic-Systematic Model (Chaiken, 1980) is similar to the Elaboration Likelihood Model, but instead of the central and peripheral route, it has the heuristic and systematic route to process information. Systematic processing entails a relatively analytic and comprehensive treatment of judgment-relevant information (Chen & Chaiken, 1999). Heuristics processing involves the activation and application of judgmental rules or heuristic's that, like other knowledge structures, are presumed to be absorbed and stored in memory (Chen & Chaiken, 1999).

Message credibility can be connected to visual attention by analyzing heuristic versus systematic information processing. This theory can be linked to message credibility in this study due to the idea that those who are more visually attentive to the message might be more critical of the credibility of the PSA. According to a systematic view, subjects exert considerable cognitive effort in actively attempting to comprehend and evaluate the message's arguments as well as to assess their validity in relation to the message's conclusion (Chaiken, 1980). In contrast, someone with a heuristic view exerts comparatively little effort in judging message validity and may rely on more accessible information, such as non-content cues in deciding to accept a message's conclusion (Chaiken, 1980). Dillard and Peck (2000), claim "features that define PSAs align well with the conditions that are thought to prompt heuristic processing (p. 463)." Typically, PSAs are around 10 - 60 seconds long and are usually designed to make a single point in a straightforward manner, which lacks argumentative structure (Dillard & Peck, 2000).

There was not any specific research on perceived credibility of PSAs in relation to visual attention. Therefore, this study will be able to fill a void to help answer the relationship between subjects' visual attention and perceived credibility of the message. Based on the literature, if a participant views a PSA longer, there might be a positive effect on overall message credibility. It is predicted that longer elaboration will induce a positive attitude toward a message including perceived credibility. Based on this idea, the following hypothesis (H4) was proposed:

H4: Total fixation duration (TFD) has a positive effect on message credibility.

Attitude Toward Message

Attitude toward advertising, which can be used for public service announcements as well, is defined as "a learned predisposition to respond in a consistently favorable or unfavorable manner toward advertising in general (p. 54)" (MacKenzie & Lutz, 1989). Applied research, specifically the Advertising Research Foundation copy testing project (Haley & Baldinger, 1991), suggested liking of an ad may be the best indicator of effectiveness (Brown & Douglas, 1992). This can also be applied to PSAs, because if the audience likes the PSA, it can be considered more effective. This is useful to consider for this study, because the attitude toward the PSAs can be linked to the success of the message.

Attitude in connection to credibility has been studied in numerous psychology, sociology and marketing studies (Aronson, Turner, & Carlsmith, 1963; Goldsmith et al., 2000b; Heesacker, Petty, & Cacioppo, 1983; Lafferty, 2007; West, 1994). In experimental investigations of the persuasive effect of credibility, it has been frequently demonstrated that highly trustworthy messages induce a greater positive attitude toward the position they advocate in comparison to less credibility (Sternthal, Dholakia, & Leavitt, 1978). Heesacker et al. (1999) studied credibility and how it affected message-relevant thinking toward attitude change. It found that high

credibility sources were thought to cause increased acceptance of a message because they were associated with favorable outcomes (e.g. being correct) (Heesacker et al., 1983). Therefore, consumer perception of credibility can help explain the relationship between visual attention and overall attitudes toward an advertisement (Bae, 2016).

Thus, the following hypothesis (H5) is posited:

H5: Perceived message credibility will have a positive impact on attitude toward a public service announcement.

The proposed hypotheses are summarized in the following model:

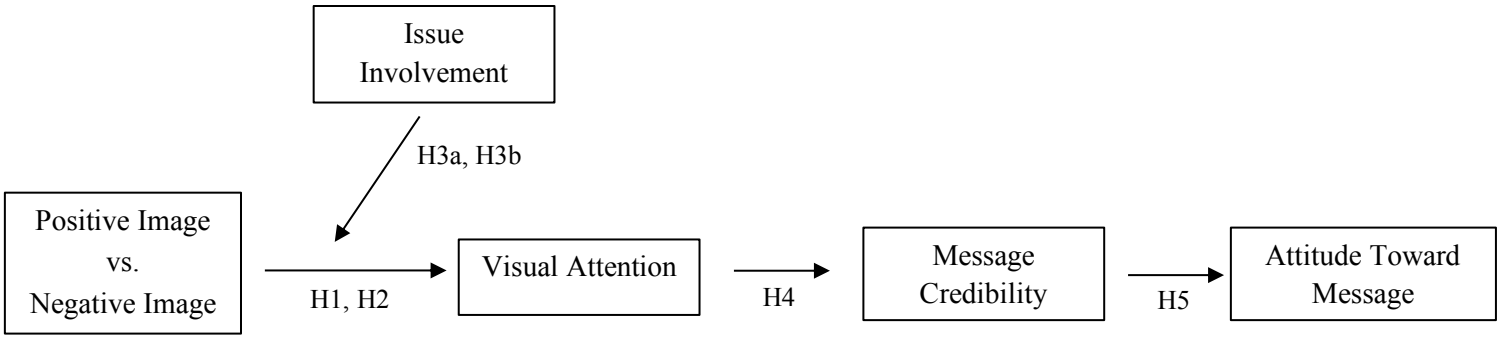

Figure 1: Proposed Model

CHAPTER 3

METHOD

Study Design

This experimental study examined two versions of a public service announcement (PSA) for a fictitious global warming awareness campaign. Hypotheses were tested using a 2 (image valence: positive vs. negative image) X 2 (cause involvement: high vs. low) between-subjects design. The independent variables were the positive/negative image, and cause involvement. The dependent variables were perceived message credibility and attitude toward the message, which were measured after exposure to the stimulus.

Sampling

One hundred and forty-seven undergraduate students at a large south-central university were recruited and received extra course credit for their participation. All participants provided valid responses and provided high-quality visual data resulting in a total sample size with no exclusions. The sample size was in accordance with the recommended minimum cell size of 20 observations (Hair, Black, Babin, Anderson, & Tatham, 1998). Among 147 participants, 46 (31.3 percent) were male and 101 (68.7 percent) were female. Their ages ranged from 18 to 27 years old with a mean age of 20.36 years old (SD=1.47). The majority of the participants were White/Caucasian (76.2

percent), followed by Asian/ Pacific Islander (6.8 percent). Table 1 summarizes the key demographic characteristics of the participants.

Table 1: Participants' Demographic Characteristics

Gender[a]	Male	46 (31.3%)
	Female	101 (68.7%)
Age[b]		20.36 (1.47)
Ethnicity[a]	White/ Caucasian	112 (76.2%)
	Asian/Pacific Islander	10 (6.8%)
	Black or African American	8 (5.4%)
	Hispanic	8 (5.4%)
	Native American or American Indian	4 (2.7%)
	Other	5 (3.4%)

Notes: a. Number of cases with percentages in parentheses. b. Mean value with standard deviations in parentheses.

Stimuli Development

The stimuli were developed through two pretests. 115 undergraduate students (who did not participate in the main study) were recruited from an online class to complete an online survey to choose the visual stimuli. Operating on the online survey website, Qualtrics, nine positive or nine negative images relating to global warming were shown to each survey participant. Using randomization, participants were either asked to judge the positive or negative images by answering two questions after each image. For those shown the positive options, participants were asked to "indicate the degree to which they felt each of the feeling while they were viewing the picture." Participants were given a seven-point Likert-type scale ranging from

the extent to which they felt happy, joyful for positive or sad, sorrowful for negative (see Appendix C for first pretest questionnaire).

From the first pretest, three positive and three negative images were chosen for the second pretest. According to the results, three images ($M_1 = 5.71$, $M_2 = 5.44$, $M_3 = 5.40$) were chosen to be included in the second pretest. Three negative images were also chosen ($M_1 = 5.58$, $M_2 = 5.38$, $M_3 = 4.40$) from the first pretest results. However, subsequently all other images chosen were of animals other than Negative7 showing a burning landscape. Negative4 ($M = 4.27$), which had the next highest mean and included an animal, was selected instead for the study.

To choose the final visual stimuli for the study, an additional 41 undergraduate students who did not participate in the first pretest and did not participate in the main study were asked to take the same online survey, but instead of being shown nine total images, they were only shown the three images selected from the first pretest. Randomization was also used in this pretest so the participants either saw the positive or negative images and were asked to rate the extent to which they felt happy, joyful, sad or sorrowful for each of the three images using the same seven-point Likert-type scale used in the first pretest.

A one-way ANOVA test was conducted to examine if there was a significant difference between the image groups. This means the differences between the positive and negative images were statistically significant for the positive images $F(1, 39) = 72.36$, $p = .001$, and for negative, $F(1, 39) = 77.23$, $p = .001$. For positive images, Image3 had the highest value with $M = 6.13$, Image1 had the second highest mean with $M = 5.80$ and Image2 had the lowest mean with $M = 5.48$. For the negative images, Image6 had the highest value with $M = 5.67$, Image4 had the second highest value with $M = 4.40$ and Image5 had the lowest mean with $M = 4.10$. Through these results, Image3 (see Appendix H) was chosen for the positive image and Image6 (see

Appendix I) was chosen for the negative image for the final public service announcement. Tables 2 and 3 display the results from both pretests.

Table 2

First Pretest Images One-Way ANOVA

	Sum of Squares	*df*	*Mean Squares*	*F*	Partial η^2
Between	72.07	1	72.07	72.36**	.001
Within	38.84	39	.996		
Total	110.91	40			

*$p < .05$ **$p < .01$

Table 3

Second Pretest Images One-Way ANOVA

	Sum of Squares	*df*	*Mean Squares*	*F*	Partial η^2
Between	81.11	1	81.11	77.28**	.001
Within	40.93	39	1.05		
Total	122.05	40			

*$p < .05$ **$p < .01$

Procedure

For the main study, participants were invited to the Media & Communication Psychology Eye-Tracking Lab. Participants were greeted upon arrival and provided an informed consent form to sign before beginning the data collection (see Appendix F). After completion of the consent form, participants went through a calibration procedure requiring them to look at a moving red circle on the Tobii eye-tracking system (Stockholm, Sweden). Participants had to sit at a specific distance of 65 cm from the monitor and move as little as possible to ensure the experimental effects.

Once the eye-tracking system calibrated successfully, a welcome slide appeared to thank students for taking time out of their day to participate. Next, a study overview slide was displayed to explain the bullseye shown, which made sure each participant looked at the same place before shown the image, and to ensure the participant was comfortable by telling him or her to act as if he or she were viewing a computer screen on an everyday basis to relieve nerves and make the participants comfortable.

There was a control advertisement shown before both the positive and negative PSAs to give subjects an opportunity to see what to expect; however, they were not told the first one did not apply to the study. Participants only viewed either the positive or negative PSA. The PSA message was presented on a 25-inch monitor with a 1280 x 1024-pixel resolution. Initial eye position data was recorded via Tobii Studio software.

Next, participants were instructed to complete a digital survey administered through Qualtrics using a separate laptop computer. The survey included questions about personal involvement with global warming, perceived message credibility, general attitude toward the message and demographic questions see Appendix G for list of questions used.

After completion of the survey, participants were debriefed on where the eye tracker was located and asked if they would like to see the results from their participation. If participants answered yes, they were shown the heat map indicating where they looked most and a gaze plot video, which mapped out individual fixation from the participant. See Appendix J to view the heat maps from all participants' results.

Measures

Visual Attention

A fixation is defined as an eye position measure when the eyes rest for a brief moment and visual information is gathered (Wolfe & Horowitz, 2004). To measure visual attention, two relevant visual metrics are used: time to first fixation (TFF) and total fixation duration (TFD). Time to first fixation is the time in seconds from when stimulus was shown until the start of the first fixation with an area of interest. TFF indicates where participants' eyes stop first on the image. Total fixation duration is the length of the fixation in seconds within an area of interest. It indicates how many times the participant looks at the area of interest (Behe et al., 2015). In this study, fixation duration will be measured with a minimum threshold of a millisecond, the recognized requirement for basic visual stimulus processing (Rayner, 2009).

Cause Involvement

To measure cause involvement, the most effective and generalizable type of scale is the semantic differential type (Osgood, Suci, & Tannenbaum, 1957). The Semantic Differential consists of a series of bipolar items, each measured on a seven-point rating scale. It is easy to administer and takes only a few minutes to complete (Zaichkowsky, 1985).

For this study, participants completed a questionnaire administered by Qualtrics using a 5 item, seven-point scale adopted from Grau and Folse (2007) to identify whether the cause of the

PSA “is unimportant/important to me, means nothing to me/means a lot to me, is not personally relevant to me/is personally relevant to me, doesn’t/does matter a great deal to me, and is of no/ is of great concern to me.” By distinguishing how involved participants are by using a seven-point bipolar scale, the visual attention variable will be better understood in connection to involvement to global warming.

Message Credibility

For the perceived message credibility measure, this study used eight developed items based on MacKenzie and Lutz (1989, p. 58), Yoo and MacInnis (2005, p. 1401) and Appelman and Sundar (2016, p. 71). The eight items for message credibility used in the survey included "believable, convincing, truthful, realistic, credible, reliable, accurate and authentic.”

The credibility perception was measured on a seven-point Likert type-scale ranging from strongly disagree (1) to strongly agree (7). The items consisted of the following eight statements: I think public service announcements are believable; I think public service announcements are convincing; I think public service announcements are truthful; I think public service announcements are realistic; I think public service announcements are credible; I think public service announcements are reliable; I think public service announcements are accurate; I think public service announcements are authentic (Zaichkowsky, 1985).

Attitude

This study adopted the three indicators of attitude from MacKenzie and Lutz (1989) to measure perceived attitude toward the PSA. Each question used a seven-point bipolar scale for participants to rank the extent to which they thought the PSA was “good/bad, pleasant/unpleasant and favorable/unfavorable (MacKenzie & Lutz, p. 58).” Table 4 displays the means and standard deviations, reliabilities and measures of the distribution of the key variables.

Table 4: Means and Standard Deviations, Reliabilities and Measures of the Distributions of the Key Study Variables

Name of Scale/Items	Mean (SD)	*Cronbach's* α	Skewness[a]	Kurtosis[a]
Issue Involvement	5.45 (1.27)	.95	-1.02 (.20)	1.49 (.40)
I think the "Global Warming" cause in the public service announcement is unimportant to me - important to me.	5.56 (1.34)			
I think the "Global Warming" cause in the public service announcement means nothing to me - means a lot to me.	5.36 (1.37)			
I think the "Global Warming" cause in the public service announcement is irrelevant to me - is relevant to me.	5.59 (1.34)			
I think the "Global Warming" cause in the public service announcement doesn't matter a great deal to me – matters a great deal to me.	5.35 (1.44)			
I think the "Global Warming" cause in the public service announcement is of no concern to me – is of great concern to me.	5.39 (1.45)			
Attitude	5.45 (1.08)	.70	-.46 (.20)	-.25 (.40)
The public service announcement was good – bad.	5.68 (1.28)			
The public service announcement was pleasant – unpleasant.	5.25 (1.56)			
The public service announcement was favorable – unfavorable.	5.43 (1.24)			
Message Credibility	5.07 (.73)	.86	-.84 (.20)	1.85 (.40)
I think public service announcements are believable.	5.39 (1.06)			
I think public service announcements are convincing.	5.13 (1.09)			
I think public service announcements are truthful.	5.06 (.99)			
I think public service announcements are realistic.	5.02 (1.13)			
I think public service announcements are credible.	5.08 (.87)			
I think public service announcements are reliable.	5.03 (.94)			
I think public service announcements are accurate.	5.00 (1.09)			

CHAPTER 4

RESULTS

The model created for this study is examined to study the relationship between changing image valence and relating visual attention to credibility and attitude. The purpose of this study was to evaluate the interaction between image valence (positive versus negative) with the moderating role of issue involvement and analyze the impact of visual attention on message credibility and attitude.

Data Analysis

The first hypothesis predicted image valence would affect time to first fixation. The second hypothesis examined if image valence affects total fixation duration. The third hypothesis assessed the moderating role of issue involvement on visual attention. The fourth hypothesis predicted visual attention affects message credibility. And lastly, the fifth hypothesis predicted message credibility would impact attitude toward the message. To test these hypotheses, this study conducted ANOVAs and simple linear regression. All data analysis to investigate these concepts were executed on SPSS 24 (IBM Corp. 2016). Before the main analysis, a normal distribution check was conducted to check if there were any outliers or abnormal outcomes in the data. All data were checked as normal without any outliers.

Effects of Image Valence on Visual Attention

It was predicted image valence would affect where viewers looked first. Hypothesis 1 predicted a negative image would have a shorter time to first fixation. To test this hypothesis, a one-way analysis of variance (ANOVA) was applied with image valence (positive or negative) as the independent variable and visual attention (TFF) as the dependent variable. An analysis of association was conducted to determine the strength of association and explained variance. According to the data, TFF $M_{negative}$= 0.86 (SD = .70) and $M_{positive}$=0.76 (SD =.79), therefore the positive image had a shorter TFF. The value of *F* for TFF is .601, and its significance is .440, which is higher than *p*-value of .05, thus not statistically significant. As Table 5 shows, partial η^2 = .004, indicated a very weak relationship between TFF and image type. Therefore, H1 was not supported (F (1,142) = .601, $p > .05$).

Hypothesis 2 predicted a negative image would keep audience attention longer than the positive image. Results from the one-way ANOVA with image condition (positive or negative) as the independent variable and visual attention (TFD) as the dependent variable indicated $M_{negative}$= 5.47 (SD = 1.33) and $M_{positive}$= 5.11 (SD = 1.48). The *p*-value of *F* for TFD is .124, also above the *p*-value of .05. As Table 4 shows, partial, η^2= .016, indicated a very weak relationship between TFD and image type. Consequently, the *F*-test is not statistically significant, thus, H2 was not supported (F (1,145) = 2.40, $p > .05$). However, the results are in the predicted direction. See Table 5 for the means and standard deviations of TFF and TFD.

Table 5: Means and Standard Deviations of TFF and TFD for Image Valence

Dependent Variables	Valence Type				
	Negative (N=72) Mean (SD)	Positive (N=72) Mean (SD)	*F*	*p*	partial η^2
Time to First Fixation	0.86 (.70)	0.78 (.79)	.601	.440	.004
Total Fixation Duration	5.47 (1.33)	5.11 (1.48)	2.40	.124	.016

Effects of Image Valence and Issue Involvement on Visual Attention

Hypotheses 3a and 3b predicted image valence with the moderating role of issue involvement affecting visual attention. Level of involvement (high or low) was determined by the median value of all involvement levels within participants (median = 6.47).

Hypothesis 3a predicted individuals with a higher level of involvement would have a shorter TFF regardless of image valence; whereas, those with a lower level of involvement would have a shorter TFF with the negative valence. A two-way ANOVA was conducted with image valence (positive or negative) and the levels of issue involvement (high or low) as the independent variables and visual attention (TFF) as the dependent variable revealed a main effects of image valence, F (1,139) = .576, p = .449, η^2=.004, involvement F (1, 139) = .303, p = .583, partial η^2=.002.

The main effect of the condition was statistically significant F (1, 139) = 3.97, p = .048. According to the data, TFF for negative valence with high involvement $M_{negative(high)}$= .72 (SD = .12), had a shorter TFF compared to the same negative valence with low involvement $M_{negative(low)}$= 1.04 (SD = .13). However, high involvement for positive valence displayed the opposite results and had a longer TFF than those with low involvement, $M_{positive(high)}$= .88 (SD = .14), $M_{positive(low)}$= .70 (SD = .14). Also, as opposed to the hypothesis prediction, individuals with a low involvement exhibited a longer TFF on the negative valence compared to high involvement for the negative valence $M_{negative(low)}$=1.04 (SD = .13), $M_{negative(high)}$= .72. Thus, H3a was not supported.

Hypothesis 3b predicted individuals with a higher level of involvement would have a longer TFD regardless of image type; but participants with a lower level of involvement would have a longer TFD with the negative condition. According to the data, a longer TFD was only presented when shown the negative valence, $M_{negative(high)}$ = 5.67 (SD = 1.13), $M_{negative(low)}$ = 5.22

(SD = 1.51). While the positive valence did not have a higher TFD for higher involved participants, $M_{positive(high)}$= 4.87 (SD = 1.72), $M_{positive(low)}$= 5.25 (SD = 1.30). Individuals with low involvement displayed a shorter TFD for the negative image $M_{negative(low)}$= 5.22 (SD = 1.51), $M_{negative(high)}$= 5.67 (SD = 1.13). Therefore, H3b was also not supported. The main effect of condition was not statistically significant (F (1, 139) = .58, p > .05, partial η^2 = .001).

Table 6: Means and Standard Deviations of Visual Attention with Issue Involvement

	Valence Type			
	Negative		Positive	
	Low	High	Low	High
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Time to First Fixation	N = 32 1.04 (.88)	N = 40 0.72 (.47)	N = 42 0.70 (.69)	N = 29 .88 (.93)
Total Fixation Duration	N = 33 5.22 (1.51)	N = 40 5.67 (1.13)	N = 43 5.25 (1.30)	N = 30 4.88 (1.72)

Effects of Visual Attention on Message Credibility

Hypothesis 4 predicted visual attention would have a positive effect on message credibility. A simple regression analysis was employed to investigate TFD as the predictor and message credibility as the dependent variable. As shown in Table 7, TFD had a not significant impact on message credibility ($\beta = .146$, $t\ (147) = 1.77$, $p = .078$, $R^2 = .02$).

Tolerance is 1.00 for message credibility, so it is well above the 0.20 standard for problems. The VIF is 1.00, well below the 4.0 or above standard for problems. Both of the values indicate no multicollinearity in this data. The *F*-test result is not significant at .078, which is above the recommended *p*-value of .05. This result indicates there is a not a significant relationship between the dependent variable and the independent variable. The beta weight of .146 indicates a positive relationship between TFD and message credibility. An *R* of .146 indicates the independent variable has a small effect on the dependent variable according to Frankfort-Nachmias and Leon-Guerrero's guidelines. The R^2 value of .021 indicates the model explains only 2.1% of the variation. The Adjusted R^2, .015, is very close to the value of R^2 value of .021. Thus, it indicates the sample appears to represent the population. Due to the low R^2 and the significance of .078, H4 was not supported.

Table 7: Results of Regression for Visual Attention Predicting Message Credibility

	Unstandardized Coefficients		Standardized Coefficients		
	B	Standard Error	Beta	*t*	*p*
TFD	.08	.04	.15	1.77	.078

Note: Dependent Variable = Message Credibility, $R^2 = .02$

Effects of Message Credibility on Attitude Toward Message

Hypothesis 5 predicted message credibility would have a positive impact on attitude toward a PSA. To test this hypothesis, a simple linear regression analysis was conducted with message credibility as an independent variable and attitude as a dependent variable. The regression results showed a significant positive effect of credibility on attitude ($\beta = .388$, t (147) $= 5.05$, $p = .001$, $R^2 = .15$). This finding supported Hypothesis 5. Table 8 summarizes the hypothesis results.

The F-test result is significant at .001, which is below the recommended p-value of .05. Thus, this result indicates there is a statistically significant relationship between the dependent variable and the independent variable. The p-values for t of .001 indicate the slopes (B) and beta weight of all variables are significant. The beta weight of .388 indicates a positive relationship between message credibility and attitude. An R of .388 indicates the independent variable has a medium effect on the dependent variable according, to Frankfort-Nachmias and Leon-Guerrero's guidelines. The R^2 value of .151 indicates the model explains 15.1 percent of the variation. The Adjusted R^2, .145, is very close to the value of R^2 value of .151. Thus, it indicates the sample appears to represent the population. Due to positive beta weight of .388 and the significance of .001, H5 was supported (Y= 2.554 + .572 (message credibility)).

Table 8: Results of Regression for Message Credibility Predicting Attitude

	Unstandardized Coefficients		Standardized Coefficients		
	B	Standard Error	Beta	*t*	*p*
Message Credibility	.57	.11	.39	5.05	.001

Note: Dependent Variable = Attitude, $R^2 = .15$

Table 9: Descriptive Statistics of Each Variable

	N	Minimum	Maximum	Mean	SD	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	SE	Statistic	SE
TFD	147	.06	6.88	5.29	1.41	-1.85	0.200	2.95	0.397
TFF	147	.14	4.43	.8152	0.75	2.18	0.202	5.72	0.401
MC	147	1.88	6.88	5.07	0.73	-0.84	0.200	1.851	0.397
InG	146	1	2	1.48	0.50	0.83	0.201	-2.02	0.399
Attitude	146	2.33	7.00	5.45	1.08	-0.46	0.201	-.266	0.399

Table 10: Summary of the Hypotheses Results

Hypotheses	Mean (SD)	Test	Support	Test Size
H1 Negative image would have a shorter time to first fixation	$M_{negative}$ = 0.86, SD = .70 $M_{positive}$= 0.76, SD =.79	*F* (1, 142) = .601	Not supported	Partial η^2= .065
H2 Negative image would keep audience attention longer than the positive image	$M_{negative}$ = 5.47, SD = 1.33 $M_{positive}$ = 5.11, SD = 1.48	*F* (1,145) = 2.40	Not supported	Partial η^2= .016
H3a Higher involvement would have a shorter TFF regardless of image valence; lower level of involvement would have a shorter TFF with the negative valence	$M_{negative(high)}$ = .72 SD = .12, $M_{negative(low)}$ = 1.04 SD = .13 $M_{positive(high)}$ = 0.88, SD = .14, $M_{positive(low)}$ = 0.70, SD = .14	F (1, 139) = 3.97	Not supported	Partial η^2= .03
H3b Higher level of involvement would have a longer TFD regardless of image type; lower level of involvement would have a longer TFD with the negative condition	$M_{negative(high)}$ = 5.67, SD = 1.13, $M_{negative(low)}$ = 5.22, SD = 1.51 $M_{positive(high)}$ = 4.87, SD = 1.72 $M_{positive(low)}$ = 5.25, SD = 1.30	*F* (1, 139) = .58	Not supported	Partial η^2= .02
H4 Visual attention would have a positive effect on message credibility	$\beta_{message\ credibility}$ = .15	*t* (147) = 1.77	Not supported	R^2= *.02*
H5 Message credibility would have a positive impact on attitude toward a PSA.	$\beta_{attitude}$ = .39	*t* (147) = .388***	Supported	R^2= *.15*

Note: **$p < .01$, ***$p < .001$

CHAPTER 5

DISCUSSION

The primary purpose of this study was to examine the relationship between image valence and visual attention, using eye-tracking technology, to better understand the role of message credibility and analyze comprehensive attitude toward the message. In particular, the study examined the relationship between applying a positive or negative image with the moderating role of issue involvement to study if there is a difference in visual attention in relation to attitude.

Effects of Image Valence in Public Service Announcements on Visual Attention

The first main finding was that initial predictions of negative valence not only catching audience attention first (TFF) but also retaining it longer (TFD) were both not supported. However, even though the hypotheses were not supported statistically, the negative valence did have a longer TFD than the positive valence. Therefore, the findings for TFD were consistent with prior research (Chang and Lee, 2009). In relation, although negative framing is commonly used to explain the effectiveness of negative framing (i.e. loss framing), research by O'Keefe and

Jensen (2007), has suggested negative framing may not always be persuasive, thus might not have been as eye-catching, or as interesting as the positive valence PSA.

Effects of Image Valence and Issue Involvement on Visual Attention

Involvement was considered the moderating variable in this study. It was predicted that highly involved participants would have a shorter TFF and a longer TFD. It was also predicted that lower involved participants would have a shorter TFF and a longer TFD with the negative valence compared to the positive valence. Both of these predictions were also not statistically significant. However, it is noteworthy that highly involved individuals viewing the negative valence had a shorter TFF and a longer TFD, but not with the positive valence.

This is not supportive of the ELM model in that it is predicted that individuals who have the motivation to process a message are more likely to engage in thoughtful, effortful processing of the scene via central route (Park, Lee & Han, 2018). Thus, those with higher involvement should have had a shorter TFF and longer TFD regardless of image type. For lower involved participants with the positive valence, who had a shorter TFF and a longer TFD with the positive valence might suggest participants are utilizing the central route of the ELM model, but possibly for opposite rationale. The person with lower involvement may have been scrutinizing the image due to a lack of involvement with the global warming, thus viewing the image faster and for a longer period of time.

Effects of Visual Attention on Message Credibility

Although message credibility is one of the most studied aspects of communication research (Metzger, Flanagin, Eyal, Lemus & McCann, 2016), few studies have related visual attention to perceived message credibility. It was predicted visual attention would have a positive

effect on message credibility. Though the hypothesis was not significantly supported, it is notable that the correlation was indeed positive and merely insignificant. Therefore, those who viewed the PSAs longer had a positive association with message credibility. This finding is aligned with Dillard and Peck (2000), who claimed the features such as the short timing of PSAs could be connected with conditions associated with prompt heuristic processing. Meaning, because the participants saw the PSA in this study for merely 15 seconds, heuristic processing, exerting less effort than systematic processing, could have been used to process message credibility.

Effects of Message Credibility on Attitude

It was predicted message credibility would have a positive impact on attitude toward a PSA. The results supported the prediction, and this finding is consistent with prior research in that it has been frequently demonstrated that highly trustworthy messages stimulate a greater positive attitude in comparison to less credible messages (Sternthal, Dholakia & Leavitt, 1978). Therefore, message credibility should be accounted for whether using a positive or negative image in PSAs. This information would be useful for those who are creating PSAs or marketing materials to consider the substantial impact of perceived credibility on attitude.

Implications

While only one hypothesis was statistically supported, this study created a proposed model to help understand how image valence affects visual attention, message credibility and attitude. Theoretical implications for the Dual-Process Models (ELM and HSM) can be added from this study to suggest, for ELM, involvement when viewing the positive valence was significantly related to a more positive attitude. For the negative valence, both credibility and

involvement were significant when solely viewing the non-linear model of the study. However, when using a negative image, credibility is the only aspect that was significantly correlated when influencing a positive attitude. Due to the positive correlation between visual attention and message credibility, the HSM would claim participants applied heuristic processing when viewing the valence. This study fills the void of message credibility in relation to visual attention for PSAs by applying HSM that has yet to be accounted for in other academic research.

Practical implications were also determined from this study. It was found that changing the image did indeed affect overall attitude for both cases of valence. Not only the positive valence resulted in a positive attitude but so did the negative valence. This would suggest that a more positive attitude would be associated with a positive image to those who are highly involved and perceive the message as credible. This would suggest those who are making PSA campaigns should keep in mind the involvement level of the target audience along with the perceived message credibility of the PSA.

These findings can help contribute to the vast research on PSAs but none specifically tested global warming or climate change questions image valence as the difference in message appeal. This study can add unique insights
to communication efforts as well. Global warming will continue to be a common topic whether in mass media, political debates or common topics of concern. With information from the findings here, if a PSA or message about global warming were to be made, image valence will now be in the conversation along with its relation to the target audience's issue involvement and credibility to positively impact attitude. Also, utilizing eye-tracking software can now bring more research to visual attention studies to add to the existing research that has yet to use eye-tracking software for global warming public service announcements.

Limitations and Future Research

It is worth mentioning that since the stimuli were chosen by pretests, the negative PSA was noticeably more pixelated than the positive valence PSA. A future study could check the quality of images before listing them for the pretest to ensure both stimuli chosen would be of the same quality. Additionally, this study was only conducted at one university, thus limiting the ability to generalize from this sample. If the study was to be recreated, multiple locations throughout the United States would be ideal in order to create a more generalizable audience. The sample was also a convenience sample and was only offered to students in certain classes who received bonus points for participation. Therefore, the participants may have been rushed or wanted to finish quickly. Time restraint was also a limitation of this study, because of the 15 days designated for data collection, three days were canceled due to inclement weather. A possible limitation could be political affiliation in connection with the issue, while political affiliation was not asked in the survey.

As for study design, a clear manipulation check for the positive and negative image was not provided within the main study survey. If the study was duplicated, a manipulation check would be important to make sure the participants essentially perceived the positive and negative images appropriately. Moreover, participants were categorized into only two involvement groups (high and low) to measure the moderating effect of issue involvement on visual attention. The results may have differed if the study would have made three groups for involvement (high, medium and low) to include those who were near the median.

Future research could take this study one step further to determine if attitude could potentially lead to behavioral changes in participants. Attitudinal research consistently suggests that attitude is a strong, direct and positive predictor of intention (Aaker & Biel, 2013; Batra & Ray, 1986; Lafferty, 2007; Okazaki, Mueller, & Taylor, 2010; Ruiz & Sicilia, 2004). This could

be used in further research to investigate if the connection between visual attention, message credibility and attitude could eventually lead to measuring intent to change behavior. Especially with the issue of global warming predictably getting more serious, potential research may be necessary to study which appeal would be most likely to create behavioral intent rather than stopping at attitude.

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APPENDICES

APPENDIX A.

IRB Approval Form

Oklahoma State University Institutional Review Board

Date:	Monday, January 8, 2018
IRB Application No	AS17105
Proposal Title:	The Effects of Image Valence on Global Warming Issue Involvement
Reviewed and Processed as:	Expedited

Status Recommended by Reviewer(s): Approved Protocol Expires: 1/7/2019

Principal Investigator(s):

Madolynne Oaks (Seals)	Clara Mikyeung Bae
Stillwater, OK 74078	Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☐ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1.Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2.Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3.Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
4.Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Scott Hall (phone: 405-744-5700, dawnett.watkins@okstate.edu).

Sincerely,

Hugh Crethar, Chair
Institutional Review Board

APPENDIX B.

Consent Form Used for Both Pretests

Pretests Consent Form

The goal of this study is to increase knowledge of perceptions of differing types of advertising. You will see one advertising image and asked about your perception toward the image.

Your participation in this study will take approximately 10 minutes, including the time you spend reading this document.

You will be compensated 2 bonus points for your participation in the study.

There are no foreseeable risks associated with participation in this study.

Participation is voluntary. Refusal to participate will involve no penalty or loss of benefits to which are otherwise entitled. You may choose not to answer specific questions or to stop participating at any time. There are no costs to you for participating in the study. The data for this project are being collected anonymously. Neither the researcher nor anyone else will be able to link the information you provide (data) to an individual.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury, please contact the researcher (Maddy Oaks, Paul Miller Building, Room 209, Oklahoma State University, Stillwater, OK, 74077, maddy.seals@okstate.edu).

If you have questions or concerns about your role and rights as a research participant, would you like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Oklahoma State University Human Research Protection Program. If you have questions about your rights as a research volunteer, you may contact the IRB Office at 223 Scott Hall, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu.

By marking consent below, you voluntarily agree to participate in this research study, and will be led to the beginning of the study.

Consent

I have read and fully understand this consent form. I sign it freely and voluntarily. A copy of this form will be given to me. I hereby give permission for my participation in this study.

Consent ☐ Decline ☐

APPENDIX C.

First Pretest Questionnaire:

For positive condition group:

You will be presented images of advertisements. Please rate how happy/sad you find the picture.

Figure 2: Example of One of Nine Positive Images Displayed in the First Pretest

Please indicate the degree to how much you felt each of these feelings while you were viewing the picture.

Happy

- Extremely unhappy
- Moderately unhappy
- Slightly unhappy
- Neither happy nor unhappy
- Slight happy
- Moderately happy
- Extremely happy

Joyful

- Strongly disagree
- Disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Agree

Strongly agree

For negative condition group:

You will be presented images of advertisements. Please rate how happy/sad you find the picture.

Figure 3: Example of One of Nine Negative Images Displayed in the First Pretest

Please indicate the degree to how much you felt each of these feelings while you were viewing the picture.

Sad

Strongly disagree
Disagree
Somewhat disagree
Neither agree nor disagree
Somewhat agree
Agree
Strongly agree

Sorrowful

Strongly disagree
Disagree
Somewhat disagree
Neither agree nor disagree
Somewhat agree
Agree
Strongly agree

APPENDIX D.

Questionnaire Used in Second Pretest

Both conditions:

You will be presented images of advertisements. Please rate how happy/sad you find the picture.

Figure 4: Example of One of Three Images Displayed in the Second Pretest.

Please indicate the degree to how much you felt each of these feelings while you were viewing the picture.

Happy

- Extremely unhappy
- Moderately unhappy
- Slightly unhappy
- Neither happy nor unhappy
- Slight happy
- Moderately happy
- Extremely happy

Joyful

- Strongly disagree
- Disagree
- Somewhat disagree
- Neither agree nor disagree

Somewhat agree
Agree
Strongly agree

Sad

Strongly disagree
Disagree
Somewhat disagree
Neither agree nor disagree
Somewhat agree
Agree
Strongly agree

Sorrowful

Strongly disagree
Disagree
Somewhat disagree
Neither agree nor disagree
Somewhat agree
Agree
Strongly agree

APPENDIX E.

Visual Stimuli Chosen from Pretest Results

Figure 5: Final Positive Valence

Figure 6: Final Negative Valence

APPENDIX F.

Consent Form for Main Study

ADULT CONSENT FORM

The goal of this study is to increase knowledge of perceptions of differing types of advertising. You are being asked to participate in a research study using eye-tracking software in order to question what aspects of an image captures audience attention when you are exposed to visual stimuli. Your participation includes sitting in front of a computer screen and looking at a digital advertisement as you would in a normal, everyday setting. Your eye movements will be monitored and stored in a computer to be analyzed by the researcher. The video recordings of your eye movements will be permanently deleted in three years. You will also be asked twelve additional survey questions about your general tendency toward your involvement with an issue, believability of advertising claims and basic demographic information. The survey is electronic but cannot be traced back to you, your answers are confidential.

Your participation in this study will take approximately 30 minutes, including the time you spend reading this document.

You will be compensated bonus points for your participation in the study.

There are no foreseeable risks associated with participation in this study. Participation is voluntary. Refusal to participate will involve no penalty or loss of benefits to which are otherwise entitled. You may choose not to answer specific questions or to stop participating at any time. There are no costs to you for participating in the study. The data for this project are being stored anonymously. Neither the researcher nor anyone else will be able to link the information you provide (data) to an individual.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury, please contact the researcher (Maddy Oaks, Paul Miller Building, Room 209, Oklahoma State University, Stillwater, OK, 74077, maddy.seals@okstate.edu).

If you have questions or concerns about your role and rights as a research participant, would you like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Oklahoma State University Human Research Protection Program. If you have questions about your rights as a research volunteer, you may contact the IRB Office at 223 Scott Hall, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu.

By signing below, you voluntarily agree to participate in this research study, and will be led to the beginning of the experiment.

Consent

I have read and fully understand this consent form. I sign it freely and voluntarily. A copy of this form will be given to me. I hereby give permission for my participation in this study.

Signature: _____ Date: _____

APPENDIX G.

Questionnaire for Main Study

Please respond to the following statements by checking on the scale that indicates your level of agreement with each statement.

1. I think the "Global Warming" cause in the PSA
Is unimportant to me : : : : : : is important to me
(1) (2) (3) (4) (5) (6) (7)
2. I think the "Global Warming" cause in the PSA
Means nothing to me : : : : : : Means a lot to me
(1) (2) (3) (4) (5) (6) (7)
3. I think the "Global Warming" cause in the PSA
Is irrelevant to me : : : : : : Is relevant to me
(1) (2) (3) (4) (5) (6) (7)
4. I think the "Global Warming" cause in the PSA
Doesn't matter a great deal to me : : : : : : Matters a great deal to me
(1) (2) (3) (4) (5) (6) (7)
5. I think the "Global Warming" cause in the PSA
Is of no concern to me : : : : : : Is of great concern to me
(1) (2) (3) (4) (5) (6) (7)

Please respond to the following statements by checking on the scale that indicates your level of agreement with each statement.

6. The public service announcement was
Good : : : : : : Bad
(1) (2) (3) (4) (5) (6) (7)

7. The public service announcement was
Pleasant : : : : : : Unpleasant
(1) (2) (3) (4) (5) (6) (7)

8. The public service announcement was
Favorable : : : : : : Unfavorable
(1) (2) (3) (4) (5) (6) (7)

Please respond to the following statements by checking on the scale that indicates your level of agreement with each statement.

9. I think public service announcements are believable.
(1) Strongly disagree
(2) Disagree
(3) Somewhat disagree

(4) Neither agree nor disagree
(5) Somewhat agree
(6) Agree
(7) Strongly agree

10. I think public service announcements are convincing.
(1) Strongly disagree
(2) Disagree
(3) Somewhat disagree
(4) Neither agree nor disagree
(5) Somewhat agree
(6) Agree
(7) Strongly agree

11. I think public service announcements are truthful.
(1) Strongly disagree
(2) Disagree
(3) Somewhat disagree
(4) Neither agree nor disagree
(5) Somewhat agree
(6) Agree
(7) Strongly agree

12. I think public service announcements are realistic.
(1) Strongly disagree
(2) Disagree
(3) Somewhat disagree
(4) Neither agree nor disagree
(5) Somewhat agree
(6) Agree
(7) Strongly agree

13. I think public service announcements are accurate.
(1) Strongly disagree
(2) Disagree
(3) Somewhat disagree
(4) Neither agree nor disagree
(5) Somewhat agree
(6) Agree
(7) Strongly agree

14. I think public service announcements are authentic.
    (1) Strongly disagree
    (2) Disagree
    (3) Somewhat disagree
    (4) Neither agree nor disagree
    (5) Somewhat agree
    (6) Agree
    (7) Strongly agree

Please respond to the following demographic questions, your answers will remain anonymous.

15. Which gender identity do you most identify?
    Female (1)
    Male (2)
    Prefer Not to Answer (3)

16. How would you describe yourself?
    White (1)
    Hispanic or Latino (2)
    Black or African American (3)
    Native American or American Indian (4)
    Asian/ Pacific Islander (5)
    Other _____ (6)

17. What is your year in school?
    Freshman (1)
    Sophomore (2)
    Junior (3)
    Senior (4)
    Graduate Student (5)

18. How old are you? _____ (1)

APPENDIX H.

Final Positive Valence Stimuli Used for Eye-Tracking

Figure 7: Positive Valence with Wording Used in Eye Tracker

APPENDIX I.

Final Negative Valence Stimuli Used for Eye-Tracking

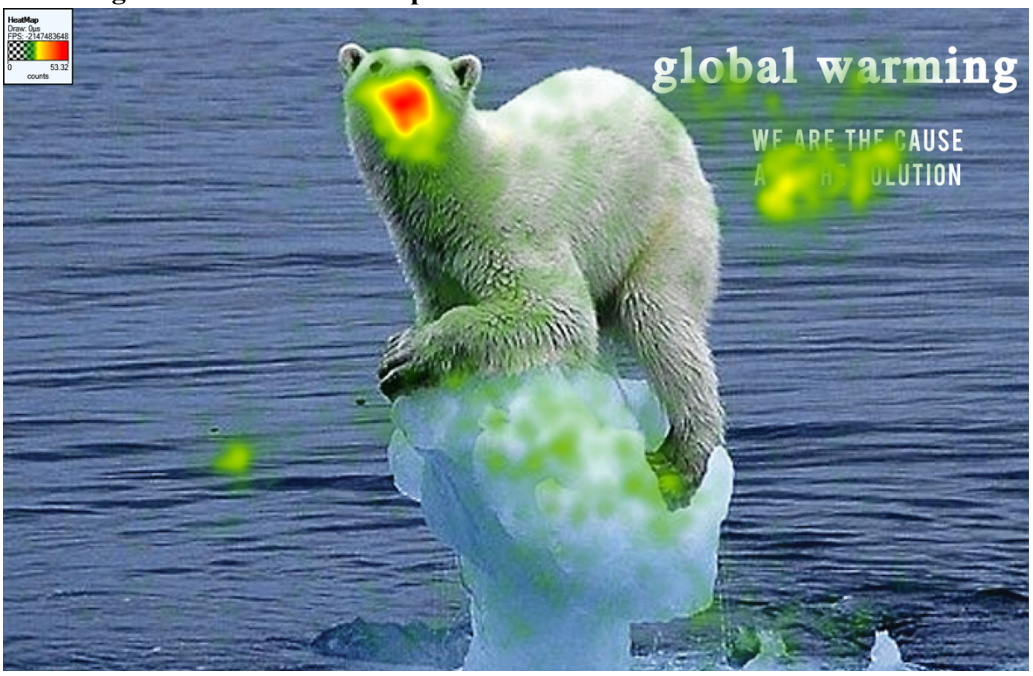
Figure 8: Negative Valence with Wording Used in Eye Tracker

APPENDIX J.

Heat Maps from Tobii Eye-Tracking System

Figure 9: Positive Valence Heat Map

Figure 10: Negative Valence Heat Map



VITA

Madolynne Jean Oaks

Candidate for the Degree of

Master of Science

Thesis: THE EFFECTS OF IMAGE VALENCE ON AUDIENCE VISUAL ATTENTION AND PERCEPTION TOWARD PUBLIC SERVICE ANNOUNCEMENTS: THE MODERATING ROLE OF ISSUE INVOLVEMENT

Major Field: Mass Communications

Biographical:

Education:

Completed the requirements for the Master of Science in your major at Oklahoma State University, Stillwater, Oklahoma in May, 2018.

Completed the requirements for the Bachelor of Science in your major at Oklahoma State University, Stillwater, Oklahoma in May, 2017.

Experience:

Professional Memberships: